

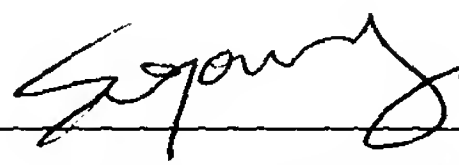
CERTIFICATION OF TRANSLATIOIN

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declare that I am well acquainted with English languages and that the document listed below has been accurately translated, to the best of my knowledge and ability:

KR application No. 10-2004-0072131

I declare under penalty of perjury that the foregoing is true and correct.

Signature  Date : July 20, 2010
So-Young KIM

[ABSTRACT]

Disclosed are a dishwasher and a control method thereof to finish a final dishwashing cycle always by an upper nozzle. The dishwasher with a wash pump and upper and lower nozzles includes a key input unit to input a user's desired command, a water level sensor sensing a water level of wash liquid, a controller controlling the dishwasher to perform cycles corresponding to the selected dishwashing course and to finish a dishwashing cycle using the wash pump always by the operation of the upper nozzle, and a load driver controlling operations of the wash pump and the upper and lower nozzles according to control signals of the controller. Since the dishwashing cycle is finished always by the upper nozzle, impurities on the tub may be washed off during the dishwashing cycle. Accordingly, contamination is minimized, a washing performance is improved, and user satisfaction regarding the product is increased.

[REPRESENTATIVE DRAWING]

FIG. 3

[INDEX WORD]

Dishwasher/ dishwashing cycle /nozzle

[SPECIFICATION]

[TITLE OF THE INVENTION]

Dish washer and method of controlling the same

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a sectional view of a general dishwasher;

FIG. 2 is a flow chart showing a control method of a dishwasher according to a prior art;

FIG. 3 is a block diagram showing the controlling structure of the dishwasher according to the present invention; and

FIG. 4 is a flow chart showing a control method of the dishwasher according to the present invention.

<DESCRIPTION OF THE SYMBOLS IN MAIN PORTIONS OF THE DRAWINGS>

100: key input unit

200: water level sensor

300: controller

400: load driver

500: drain pump

600: heater

700: storage

800: display

[DETAILED DESCRIPTION OF THE PRESENT INVENTION]

[OBJECT OF THE PRESENT INVENTION]

[FIELD OF THE INVENTION AND DESCRIPTION OF THE RELATED ART]

The present invention relates to a dishwasher, and more specifically to a

dishwasher and a method of controlling the dishwasher to finish a dishwashing cycle always by an upper nozzle.

A dishwasher is a home appliance that washes dishes by discharging high-pressure wash liquid through injection nozzles onto the dishes to remove impurities from the dishes.

Specifically, the dishwasher includes a tub forming a space inside the dishwasher for holding dishes to be washed, a sump disposed at the bottom of the tub for holding wash liquid, a drain pump attached to a side of the sump for pumping the wash liquid contained in the sump to the injection nozzles, a wash motor for driving the drain pump, a drain pump for draining dirty wash liquid after dishwashing is completed, and a drain motor for driving the drain pump.

FIG. 1 is a sectional view of a general dishwasher according to a prior art and FIG. 2 is a flow chart showing a control method of the dishwasher according to the prior art.

Referring to FIG. 1, the general dishwasher 10 having a sump structure includes a tub 11 constituting the appearance of the dishwasher 10 and including a dishwashing tub therein, a door 12 disposed at a front of the tub 11 to open and close the dishwashing tub, and a sump 20 disposed in the center of a bottom surface of the tub 11 to hold the wash liquid.

The dishwasher further includes a water guide 14 forming a path for the wash liquid pumped up by the drain pump, a lower nozzle 16 mounted at an upper part of the sump 20 and disposed at a bottom surface of the dishwashing tub to inject the wash liquid upward, an upper nozzle 15 attached to an upper part of the water guide 14 and disposed in the middle of the dish washing tub by extending perpendicularly

to the water guide 14, and a top nozzle 50 formed near a ceiling of the tub 11 to inject the wash liquid vertically downward.

In addition, an upper rack 12 is mounted to an upper part of the upper nozzle 15 so that dishes can be washed by the upper nozzle 15. A lower rack 13 is mounted to an upper part of the lower nozzle 16 so that dishes can be washed by the lower nozzle 16.

More specifically, the upper rack 12 is supported by a rail (not shown) formed on an inner surface of the tub 11 and reciprocated forward and backward.

A method of controlling the prior-art dishwasher structured as described above will be described with reference to FIG. 2. First, the dishwasher determines whether a power-on command is input by a user (S11).

If the power-on command is inputted as a result of the determination of S11, a desired course is selected and an operation command is input (S12 and S13).

Cycles corresponding to the selected course are performed (S14).

It is determined whether a wash pump is operating while the cycles are being performed (S15).

If the wash pump is operating, it is determined whether a first preset time has elapsed (S16).

If the first preset time has elapsed as a result of the determination of S16, a position of an operating nozzle is switched (S17). For example, if the upper nozzle is currently operating, the position of the operating nozzle is switched to the lower nozzle, and vice versa.

It is determined whether a second preset time has elapsed (S18).

When the second preset time has elapsed, the dishwasher continues the

operation to perform a next cycle. When the washing is completed, the dishwasher finishes the operation (S19 and S20).

As described above, according to the prior-art dishwasher and the control method thereof, the dishwashing cycle may be finished by the operation of the upper nozzle or the lower nozzle. Therefore, impurities remain on the lower rack may splash to the upper rack and contaminate the upper rack.

In other words, impurities may exist even after the dishwashing cycle is completed, thereby increasing dissatisfaction of the users related to the dishwashing performance.

[TECHNICAL OBJECT OF THE INVENTION]

It is therefore an object of the present invention to provide a dishwasher improved in the dishwashing performance.

[CONSTITUTION AND OPERATION OF THE INVENTION]

To achieve the above objects and other advantages, a dishwasher provided with a wash pump and upper and lower nozzles includes a key input unit for a user to input a desired command; a water level sensor sensing a water level of wash liquid; a controller controlling the dishwasher to perform cycles corresponding to a dishwashing course selected through the key input unit and to finish a dishwashing cycle using the wash pump always by the operation of the upper nozzle; and a load driver controlling operations of the wash pump and the upper and lower nozzles according to control signals of the controller.

To achieve the above objects and other advantages, a method of controlling a dishwasher provided with a wash pump and upper and lower nozzles includes

performing cycles corresponding to a course selected by a user ; and controlling operations of the upper and lower nozzles in a dishwashing cycle using the wash pump out of the cycles and also controlling the dishwasher so that a final dishwashing cycle is finished always by the operation of only the upper nozzle.

It is preferable that the controlling to operate only the upper nozzle may include switching an operating nozzle position when the wash pump is operated for a first preset time; and perceiving a position of the currently operating nozzle and controlling the upper nozzle to be operated when the wash pump is operated for a second preset time after switching of the operating nozzle position.

It is more preferable that the switching of the operating nozzle position may include switching the operating nozzle position to the lower nozzle if the upper nozzle is currently operated and to the upper nozzle if the lower nozzle is currently operated.

It is more preferable that the controlling of the upper nozzle may include continuing the operation for a third preset time and entering a next cycle if the currently operating nozzle is the upper nozzle; and switching the operating nozzle position to the upper nozzle if the currently operating nozzle is the lower nozzle, continuing the operation for the third preset time, and entering the next cycle.

Hereinafter, a dishwasher will be described in detail with reference to accompanying drawings.

FIG. 3 is a block diagram showing the controlling structure of the dishwasher according to the present invention. FIG. 4 is a flow chart showing a control method of the dishwasher according to the present invention.

As shown in FIG. 3, the dishwasher according to the present invention includes a key input unit 100 for a user to input a desired command, a water level

sensor 200 sensing a water level of wash liquid, a controller 300 controlling the dishwasher to perform operation cycles corresponding to a dishwashing course selected through the key input unit 100. The controller 300 also controls a wash pump 500 to be driven for a predetermined time in a cycle using the wash pump 500. In addition, the controller 300 controls so that a final rinsing is performed through an upper nozzle. The dishwasher further includes a load driver 400 controlling driving of loads such as the wash pump 500 and a heater 600 according to control signals of the controller 300, a display 800 displaying the operational state according to the control signals of the controller 300, and a storage 700 storing cycle-related control values and menus.

Hereinafter, the operation of the above-structured dishwasher will be described.

A user inputs a power-on command through the key input unit 100 and selects a desired dishwashing course.

While performing the cycles corresponding to the dishwashing course selected by the user, the dishwasher determines whether to enter a dishwashing course. Here, the entry to the dishwashing course may be determined according to whether the wash pump 500 is operated.

When the wash pump 500 starts being operated, a nozzle position is controlled selectively between the upper and the lower nozzles (not shown) according to a preset operation time. When the wash pump 500 is operated for a first preset time, the nozzle position is switched and the wash pump 500 is further operated for a second preset time. When the second preset time has elapsed, the dishwasher perceives a position of the current operating nozzle and controls so that

the dishwashing cycle is finished by the upper nozzle.

In other words, it is controlled so that the dishwashing cycle is always finished by the operation of the upper nozzle.

A method of controlling the dishwasher will now be described with reference to FIG. 4. First, the dishwasher determines whether the power-on command is input by the user (S101).

If it is determined that the power-on command is input by the user, a desired course is selected and an operation command is input (S102 and S103).

Next, cycles corresponding to the selected course are performed (S104).

It is determined whether the wash pump is operated (S105).

If the wash pump is operated as a result of the determination of S105, it is determined whether the first preset time has elapsed (S106).

When the first preset time has elapsed, the position of the operating nozzle is switched (S107). For example, when the upper nozzle has been currently operated, the nozzle position is switched to the lower nozzle, and vice versa.

It is determined whether the second preset time has elapsed after the nozzle position is switched (S108).

When the first preset time has elapsed as a result of the determination of S108, it is determined whether the currently operating nozzle is the upper nozzle (S109).

If the upper nozzle has been currently operated as a result of the determination of S109, the upper nozzle continues operating for a third preset time and performs a next cycle (S110 and S111).

On the other hand, if the lower nozzle has been currently operated as a result

of the determination of S109, the nozzle position is switched to the upper nozzle and the dishwasher enters the operations S110 and S111 (S113).

[EFFECT OF THE INVENTION]

According to the dishwasher and the control method thereof of the present invention, the following effects can be expected.

First, since the dishwashing cycle is finished always by the upper nozzle, impurities present on an upper part of the tub during the dishwashing cycle may be washed off. Accordingly, contamination is minimized.

Second, since contamination is minimized, a washing performance is improved.

Third, as a consequence, user satisfaction regarding the product is increased.

WHAT IS CLAIMED IS:

1. A dishwasher provided with a wash pump and upper and lower nozzles, the dishwasher comprising:

a key input unit for a user to input a desired command;

a water level sensor sensing a water level of wash liquid;

a controller controlling the dishwasher to perform cycles corresponding to a dishwashing course selected through the key input unit and to finish a dishwashing cycle using the wash pump always by the operation of the upper nozzle; and

a load driver controlling operations of the wash pump and the upper and lower nozzles according to control signals of the controller.

2. A method of controlling a dishwasher provided with a wash pump and upper and lower nozzles, the method comprising:

performing cycles corresponding to a course selected by a user ; and

controlling operations of the upper and lower nozzles in a dishwashing cycle using the wash pump out of the cycles and also controlling the dishwasher so that a final dishwashing cycle is finished always by the operation of only the upper nozzle.

3. The method according to claim 2, wherein the controlling to operate only the upper nozzle comprises:

switching an operating nozzle position when the wash pump is operated for a first preset time; and

perceiving a position of the currently operating nozzle and controlling the upper nozzle to be operated when the wash pump is operated for a second preset

time after switching of the operating nozzle position.

4. The method according to claim 3, wherein the switching of the operating nozzle position comprises switching the operating nozzle position to the lower nozzle if the upper nozzle is currently operated and to the upper nozzle if the lower nozzle is currently operated.

5. The method according to claim 3, wherein the controlling of the upper nozzle comprises:

continuing the operation for a third preset time and entering a next cycle if the currently operating nozzle is the upper nozzle; and

switching the operating nozzle position to the upper nozzle if the currently operating nozzle is the lower nozzle, continuing the operation for the third preset time, and entering the next cycle.

Fig.1

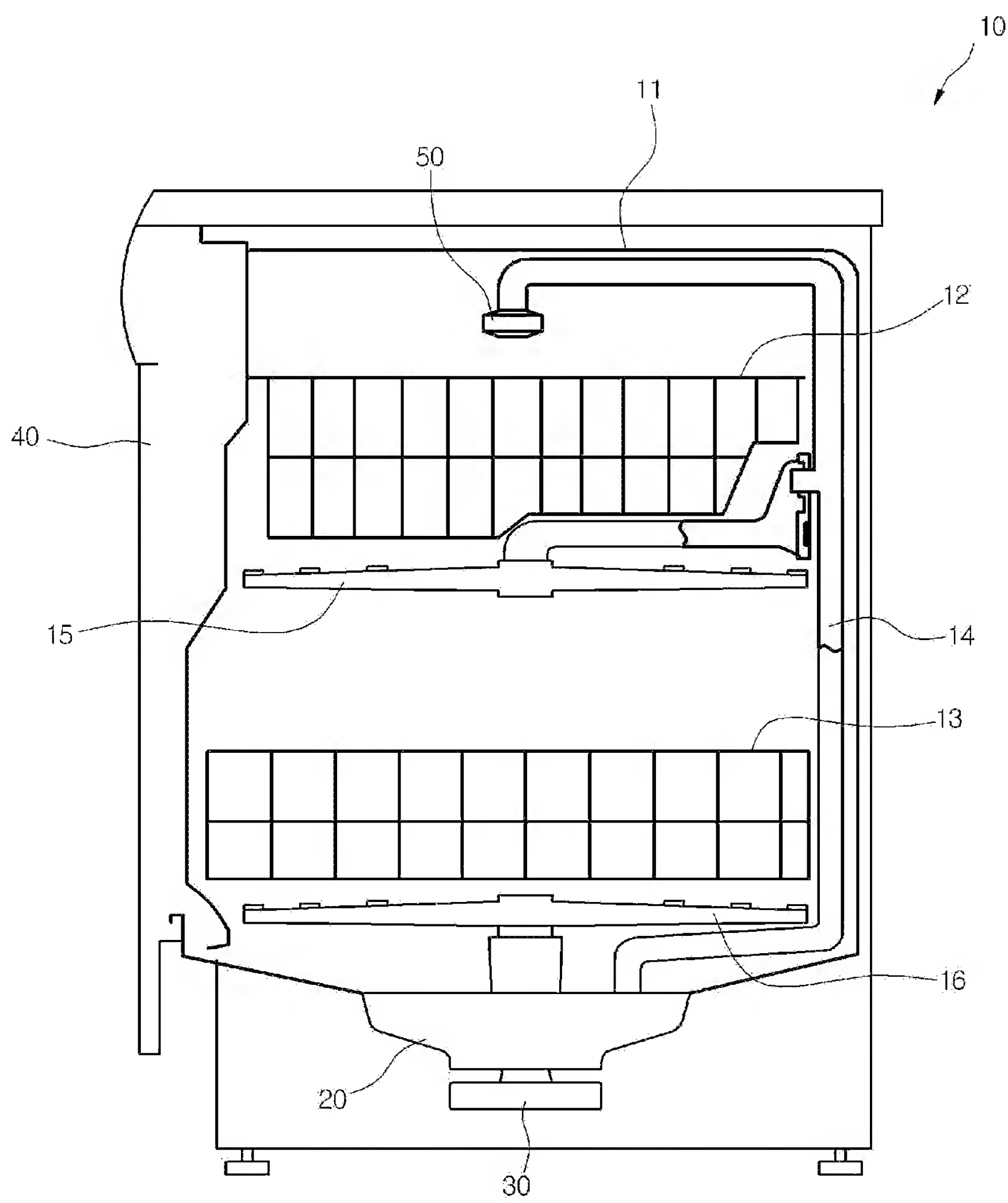


Fig.2

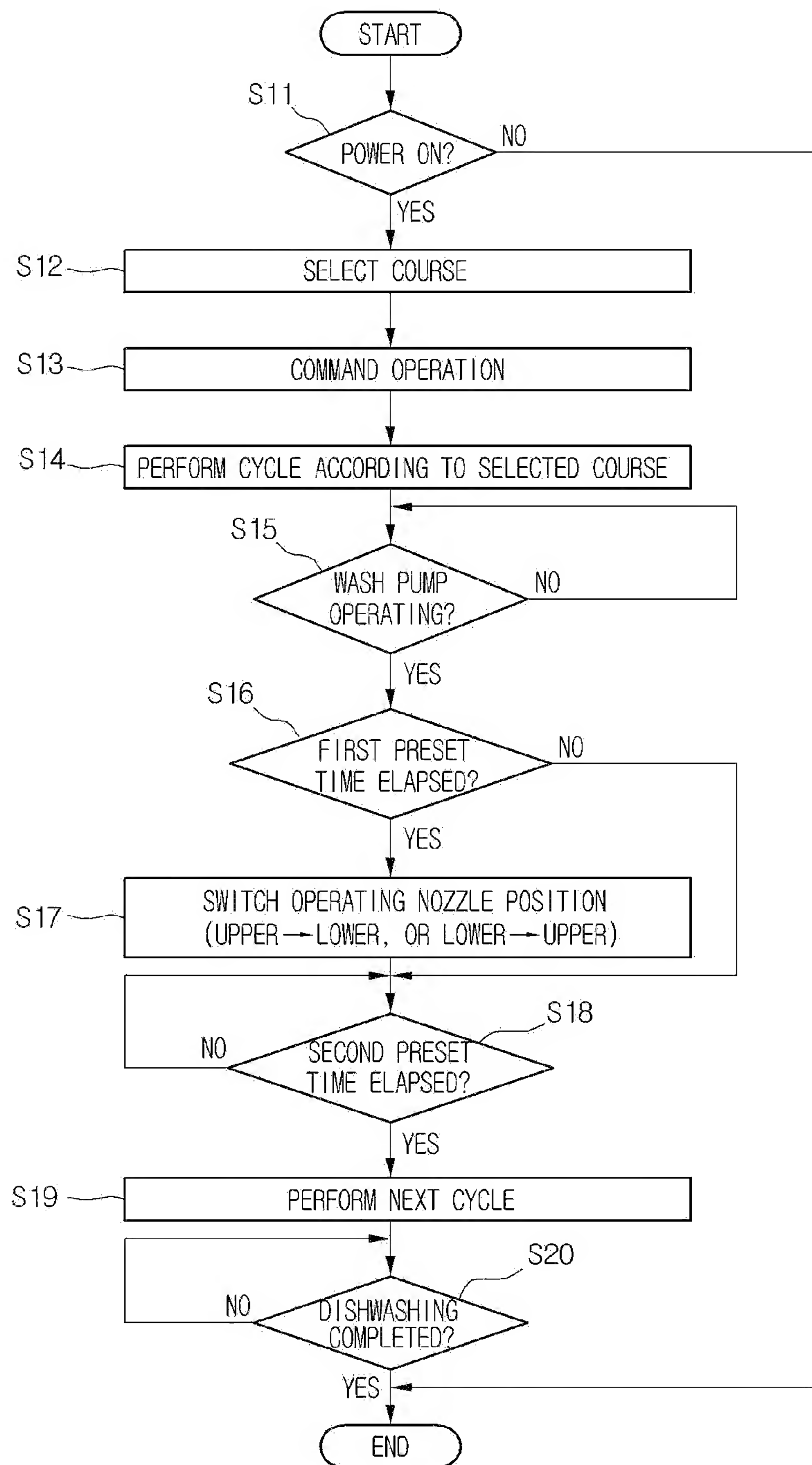


Fig.3

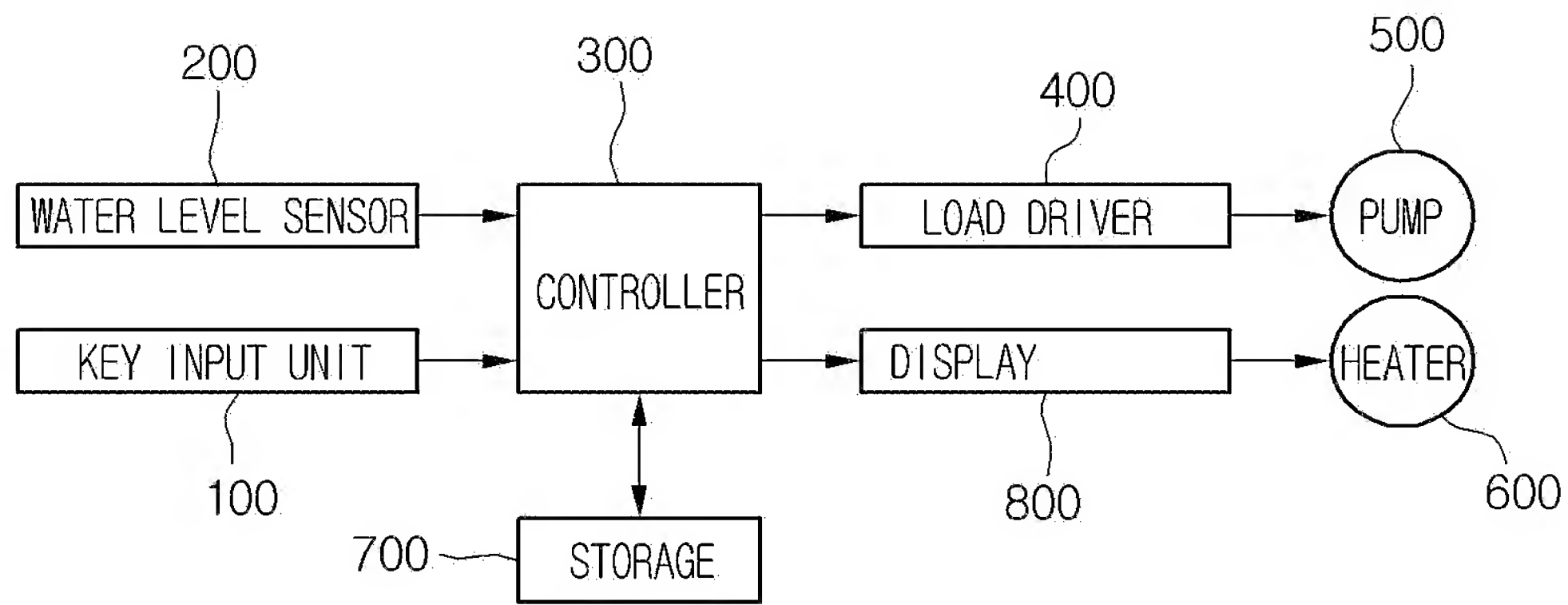


Fig.4

